



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/782.158	02/14/2001	Masayuki Orihashi	P20624	8318
7055	7590	03/29/2004	EXAMINER	
GREENBLUM & BERNSTEIN, P.L.C. 1950 ROLAND CLARKE PLACE RESTON, VA 20191			PERILLA, JASON M	
			ART UNIT	PAPER NUMBER
			2634	5

DATE MAILED: 03/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/782,158

Applicant(s)

ORIHASHI ET AL

Examiner

Jason M Perilla

Art Unit

2634

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 February 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 9, 10 and 14-17 is/are rejected.
- 7) ☒ Claim(s) 6-8, 11-13, 18 and 19 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 February 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 3-5/15/01.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-19 are pending in the instant application.

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

3. The information disclosure statement (IDS) submitted is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Specification

4. This application uses terminology of the art in such a way that may confuse the purpose of the invention. For example, signal to noise ratio is reduced to CNR on page 2, line 20. However, in the art of frequency correction, CNR may be more commonly understood as the carrier to noise ratio, and the signal to noise ratio is more commonly known as the SNR. Further, the instant application is based on handling frequency shifts as disclosed in the summary although emphasis is placed upon synchronization which is an entirely different topic in the art. The Applicant is reminded to clearly use terms of the art which may confuse the correlation of a spreading sequence and the correction of a frequency offset by the determination of a phase difference.

Claim Objections

5. Claim 1 recites the limitation "the signal" in line 7. There is insufficient antecedent basis for this limitation in the claim. The Examiner notes that a clear

distinction should be made of "the signal" which is output from the correlation calculation means to provide antecedent basis for the input to the delay detection means.

6. Claim 1 recites the limitation "the delay detection output" in line 10. There is insufficient antecedent basis for this limitation in the claim.

7. Claim 1 recites "performing correlation calculation" in line 2, although the Examiner notes that --performing a correlation calculation-- would provide proper antecedent basis for "said correlation calculation" in line 2 of claim 2.

8. Claim 3 recites "selecting one known signal from a plurality of known signals" in line 2. The Examiner suggests the use of --selecting said known signal-- or --selecting the known signal-- so that there is no confusion between the correlation using a known signal and an additional known signal.

9. Claim 4 recites the limitation "the detecting means" in line 2. There is insufficient antecedent basis for this limitation in the claim. The Examiner suggests the use of --the delay detecting means--.

10. Claim 4 recites the limitation "said known signal series" in line 2. There is insufficient antecedent basis for this limitation in the claim. The Examiner makes note that the Applicant should be consistent between the limitations including the "known signal" and the "known signal series".

11. Claim 5 recites the limitation "the signal" in line 3. There is insufficient antecedent basis for this limitation in the claim.

12. Claim 6, 7, and 8 recite limitations including "said calculation length". There is insufficient antecedent basis for this limitation in the claim. The Examiner makes note

that the Applicant should be consistent between limitations including the "the calculation length" and the "the predetermined calculation length".

13. Claim 11 recites the limitation "second calculation length controlling means".

However, there is no antecedent basis for a first calculation length controlling means in claim 11 being dependent upon claim 1 although it is implied.

14. Claim 14 recites the limitation "the signal" in line 7. There is insufficient antecedent basis for this limitation in the claim. The Examiner notes that a clear distinction should be made of "the signal" which is output from the correlation calculation means to provide antecedent basis for the input to the delay detection means.

15. Claim 14 recites the limitation "the delay detection output" in line 10. There is insufficient antecedent basis for this limitation in the claim.

16. Claim 14 recites "performing correlation calculation" in line 2, although the Examiner notes that —performing a correlation calculation— would provide proper antecedent basis for "said correlation calculation" in line 2 of claim 2.

17. Claim 16 recites "selecting one known signal from a plurality of known signals" in line 3. The Examiner suggests the use of —selecting said known signal— or —selecting the known signal— so that there is no confusion between the correlation using a known signal and an additional known signal.

18. Claim 17 recites the limitation "the signal" in line 4. There is insufficient antecedent basis for this limitation in the claim.

19. Claim 18 recites the limitation including "said calculation length". There is insufficient antecedent basis for this limitation in the claim. The Examiner makes note

Art Unit: 2634

that the Applicant should be consistent between limitations including the "the calculation length" and the "the predetermined calculation length".

Claim Rejections - 35 USC § 112

20. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

21. Claims 2 and 15 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Regarding claim 2, the claim recites the limitation, "said correlation calculation acquires a signal with a desired signal component ... increased and performs delay detection using the signal." However, the acquisition of a signal with a desired signal component that is *increased* is not enabled in the specification. One skilled in the art is unable to determine how to acquire the signal having a desired component increased. It is not clear which desired component is increased, and one skilled in the art is not enabled to understand the means by which the desired signal component was increased. Further, one skilled in art is not enabled by the specification to perform delay detection using the correlation calculating means.

Regarding claim 15, the claim recites the limitation, "said correlation calculation step acquires a signal with a desired signal component ... increased and performs delay

detection using the signal." However, the acquisition of a signal with a desired signal component that is *increased* is not enabled in the specification. One skilled in the art is unable to determine how to acquire the signal having a desired component increased. It is not clear which desired component is increased, and one skilled in the art is not enabled to understand the step by which the desired signal component was increased. Further, one skilled in art is not enabled by the specification to perform a delay detection step using the correlation calculating step.

Claim Rejections - 35 USC § 102

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

22. Claims 1, 4, 5, 8, 14, and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Komatsu (5818882).

Regarding claim 1, Komatsu discloses a radio reception apparatus (fig. 3; col. 2, lines 59-62) comprising: correlation calculating means (fig. 3, refs. 4a-n; col. 5, lines 55-67; col. 7, lines 9-18) for performing correlation calculation on a reception signal with a predetermined calculation length (inherent) using a known signal (col. 5, line 61 - "spread code"); delay detecting means (figs. 3 and 4, refs. 5a-n; col. 6, lines 3-15) for performing delay detection using the signal after said correlation calculation (col. 7, lines 18-26); and detecting means for detecting synchronization timing from the delay detection output (fig. 3, refs. 7; col. 6, lines 16-65).

Regarding claim 4, Komatsu discloses the limitations of claim 1 as applied above. Further, it is inherent that the detecting means identifies the known signal series (spreading code) when a synchronization timing is detected. The purpose of the

correlator is to produce a peak when synchronization is created between the received signal and the known sequence. Thereby, the detecting means identifies the known signal series when synchronization is detected by the correlator.

Regarding claim 5, Komatsu discloses the limitations of claim 1 as applied above. Further, Komatsu discloses that the radio reception apparatus comprises frequency estimating means (fig. 3, ref. 8; fig. 5) for detecting a frequency component included in the signal after delay detection (col. 7, line 40 – col. 8, line 4).

Regarding claim 8, Komatsu discloses the limitations of claim 5 as applied above. Further, Komatsu discloses that the frequency estimating means detects a frequency shift (col. 7, lines 45-50).

Regarding claim 14, Komatsu discloses a synchronization timing method (fig. 3; col. 2, lines 59-62) comprising: a correlation calculating step (fig. 3, refs. 4a-n; col. 5, lines 55-67; col. 7, lines 9-18) for performing correlation calculation on a reception signal with a predetermined calculation length (inherent) using a known signal (col. 5, line 61 -“spread code”); a delay detecting step (figs. 3 and 4, refs. 5a-n; col. 6, lines 3-15) for performing delay detection using the signal after said correlation calculation (col. 7, lines 18-26); and a detecting step for detecting synchronization timing from the delay detection output (fig. 3, refs. 7; col. 6, lines 16-65).

Regarding claim 17, Komatsu discloses the limitations of claim 14 as applied above. Further, Komatsu discloses that the synchronization timing detection method comprises a frequency estimating step (fig. 3, ref. 8; fig. 5) for detecting a frequency component included in the signal after delay detection (col. 7, line 40 – col. 8, line 4).

Claim Rejections - 35 USC § 103

23. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

24. Claims 3 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Komatsu in view of Sugita et al (5862172).

Regarding claim 3, Komatsu discloses the limitations of claim 1 as applied above. Komatsu does not disclose the radio reception apparatus further comprising selecting means for selecting one known signal from a plurality of known signals. However, Sugita et al teaches a receiver in which one of two known sequences or spreading codes is selected (fig. 3A, refs. 23-25; col. 4, lines 36-43). It is obvious to one of ordinary skill in the art that the use of a plurality of known signals or spreading codes for selection would enable the reception of a plurality of signals each using a different one of the known signals. Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made to utilize a plurality of known signals and a selection circuit as taught by Sugita et al in the radio reception apparatus of Komatsu because it would enable the reception of various signals having different spreading sequences.

Regarding claim 16, Komatsu discloses the limitations of claim 14 as applied above. Komatsu does not disclose that the synchronization timing method further comprising a selecting step for selecting one known signal from a plurality of known

signals. However, Sugita et al teaches a receiver method in which one of two known sequences or spreading codes is selected (fig. 3A, refs. 23-25; col. 4, lines 36-43). It is obvious to one of ordinary skill in the art that the use of a plurality of known signals or spreading codes for selection would enable the reception of a plurality of signals each using a different one of the known signals. Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made to utilize a plurality of known signals and a selection step as taught by Sugita et al in the synchronization timing detection method of Komatsu because it would enable the reception of various signals having different spreading sequences.

25. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Komatsu in view of Tzou (5881098).

Regarding claim 10, Komatsu discloses the limitations of claim 1 as applied above. Komatsu does not disclose power calculating means for calculating the output power after delay detection. However, Tzou teaches a receiver apparatus wherein a power calculation means is used to calculate power after delay detection (fig. 3 and 4, ref. 70; fig. 5, ref. 80; col. 5, lines 24-30). Tzou teaches that the power calculating means can be effectively used to making a threshold comparison after correlation or delay detection. Therefore, it would have been obvious to one having ordinary skill at the time which the invention was made to utilize a power calculating means as taught by Tzou in the receiver apparatus of Komatsu because it could be used to make threshold comparisons of the outputs from the correlator or delay detection means.

Allowable Subject Matter

26. Claims 6-8, 11-13, 18, and 19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

27. The following is a statement of reasons for the indication of allowable subject matter:

Regarding claims 6-8, 11-13, 18 and 19, the claims objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The limitations of these dependent claims have not been shown by the prior art. The prior art does disclose several variations of coherent frequency tracking by performing calculations on difference vectors. The prior art does also teach the use of multiple spreading codes and power calculating means. However, the prior art has not been found to disclose or teach a coherent frequency tracking apparatus or method using difference vectors obtained through time shifted correlations of a spreading sequence wherein the *correlation length is varied depending upon the frequency offset found or an estimation of the channel quality.*

Conclusion

28. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following prior art references are cited to further show the state of the art with respect to coherent frequency tracking using difference vectors.

U.S. Pat. No. 5684836 to Nagayasu et al; Receiver with automatic frequency control.

U.S. Pat. No. 5093846 to Walton, Jr. et al; Frequency and phase acquisition.

U.S. Pat. No. 6687290 to Okazaki; Apparatus for frequency deviation estimation.

U.S. Pat. No. 5579338 to Kojima; Spread spectrum frequency tracking.


29. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason M Perilla whose telephone number is (703) 305-0374. The examiner can normally be reached on M-F 8-5 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Chin can be reached on (703) 305-4714. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

J m Perilla

Jason M Perilla
March 18, 2004


STEPHEN CHIN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600

jmp